F·A·A·M facility for airborne atmospheric measurements

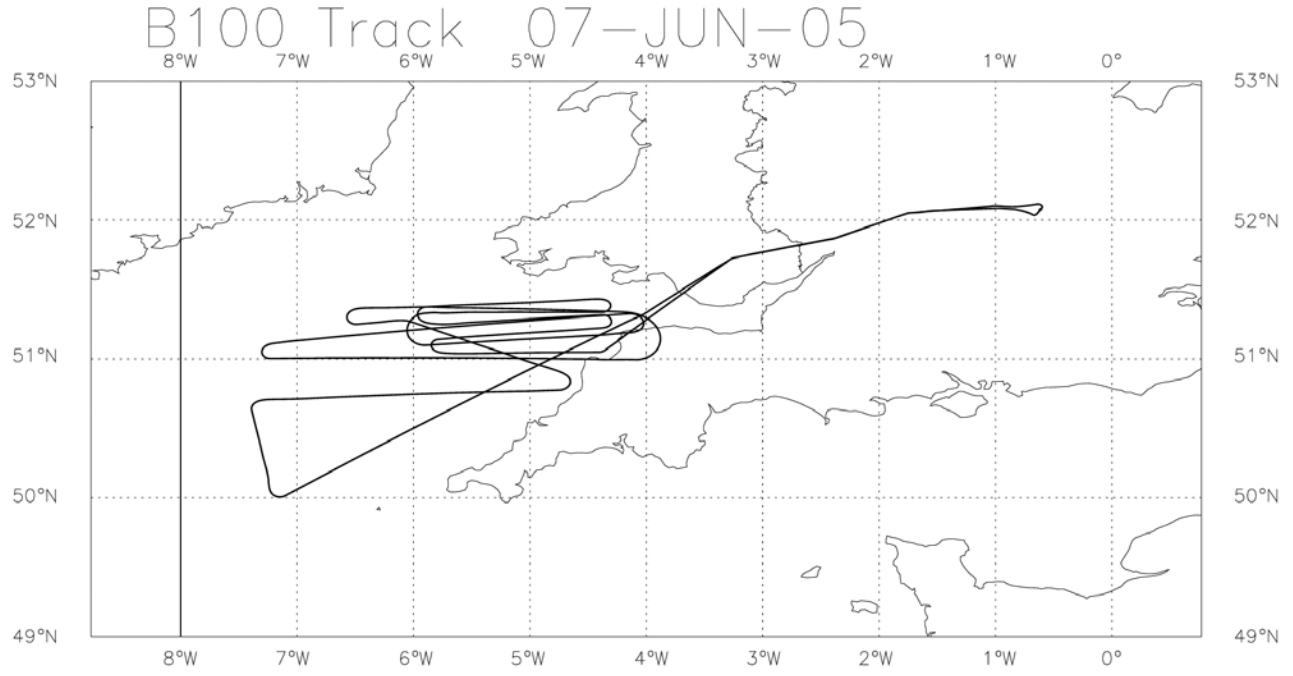
FLIGHT FOLDER

Flight No.:	B100
Date:	07 Jun 2005
Take Off	09:39:00
Landing:	14:32:45
Flight Time	4h53m45

Campaign: CIRRUS
Trials Instructions:
Operating Area: SW Approaches

POB	Position	Name	Institute
1	Captain	Alan Roberts	Directflight
2	Co-pilot	Ian Ramsey Rae	Directflight
3	CCM	Sue Angold	Directflight
4	Mission Scientist 1	Keith Bower	University of Manchester
5	Flight Manager	Alan Woolley	FAAM
6	Cloud Physics	Jamie Trembath	FAAM
7	CCM2/Cld Phys Training	Jim Crawford	FAAM
8	Core Chemistry/TDLAS	Ruth Purvis	FAAM
9	Noise	Colin Hankinson	NERC
10	CCN/CVI	Paul James	FAAM
11	CCN Training / AMS	James Allen	University of Manchester
11	Observer	Alison Perry	FAAM
12	NOxy	Andy MacDonald	UEA
13	PTr-MS	Anne Hulse	UEA
14	WAS	Jim Hopkins	York
15	ADA/CPI	Martin Gallagher	University of Manchester
16	CVI Training	Stuart Heath	FAAM
17			
18			
19			
20			

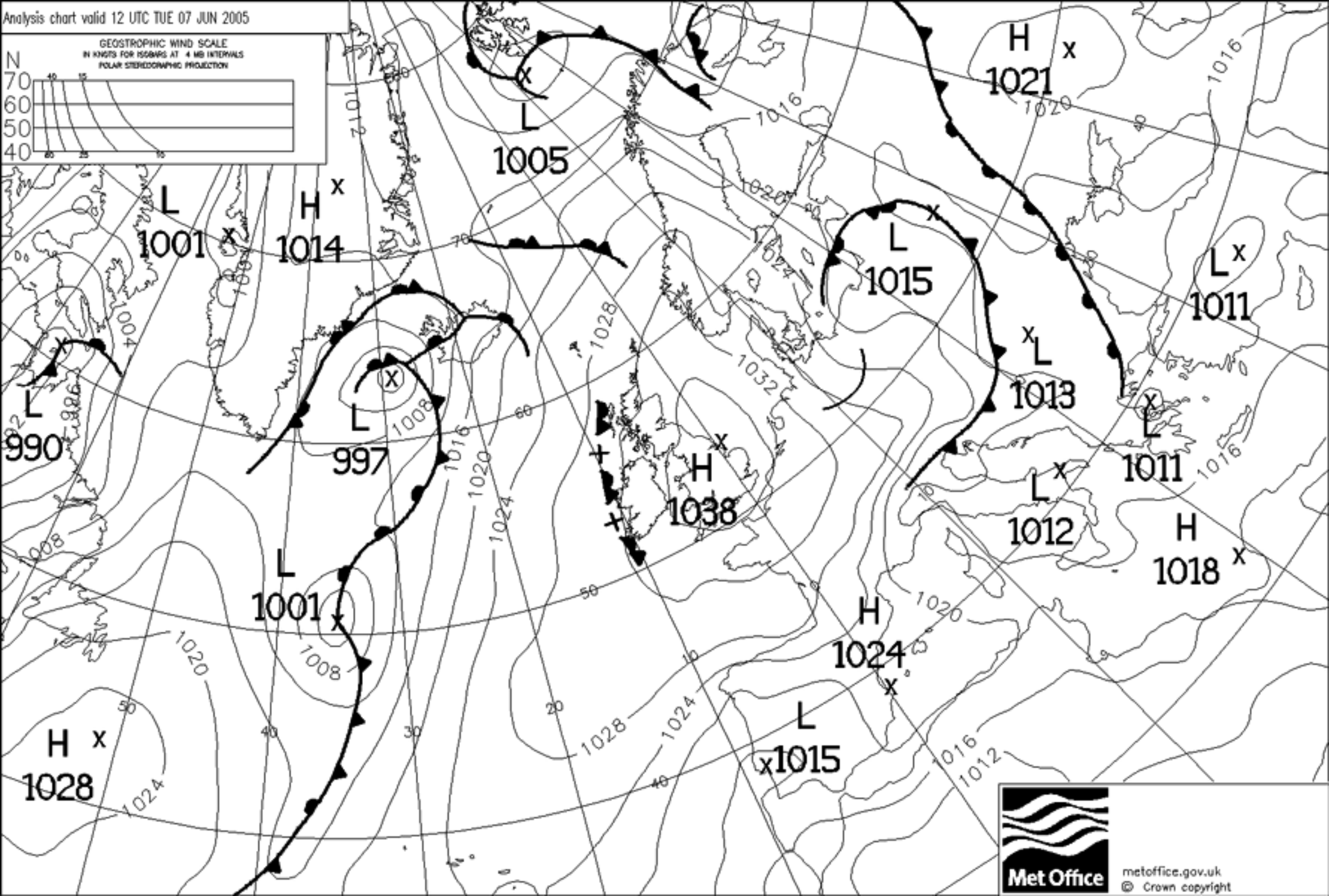
Flight Track:



FLIGHT SUMMARY

Flight No B100
Date: 7/6/05
Project: CIRRUS
Location: SW Approaches

Start Time	End Time	Event	Height (s)	Hdg	Comments
092346		engine start	-.30 kft	127	
092647		power change	-.30 kft	127	
092707		inu to nav	-.30 kft	127	
092918		taxy	-.30 kft	128	start
093900		T/O	-.28 kft	031	from cranfield
094200		asp open	5.0 kft	266	
101111	103126	Profile 1	10.0 - 28.0 kft	231	
102922		Profile 1	26.7 kft	240	rate of climb droppin
103139	104140	Run 1	28.1 kft	241	
104327	104753	Profile 2	28.1 - 30.0 kft	348	
105107	110109	Run 2	30.0 kft	081	
105641		Run 2	30.0 kft	084	intermittent contrail ing
110120	110611	Profile 3	30.0 - 32.0 kft	084	
110902	111857	Run 3	32.0 kft	299	
111857	112154	Profile 4	32.0 - 33.0 kft	294	
112107		Profile 4	32.8 kft	265	proper contrails!
NO RUN 4					
112454	113457	Run 5	33.1 - 33.0 kft	084	
113513	113707	Profile 5	33.2 - 34.0 kft	088	
114347	120545	Run 6	34.0 kft	277	
120821	122721	Run 7	32.1 - 32.0 kft	076	
122457		Run 7	32.0 kft	080	contrails stopped
123139	124241	Run 8	30.0 - 30.1 kft	270	
124652	125644	Run 9	28.1 - 28.0 kft	080	
125859	131025	Run 10	27.1 kft	276	
131302	132256	Run 11	25.0 - 25.1 kft	091	
132505	133655	Run 12	23.0 kft	265	
133852	134854	Run 13	22.0 kft	096	
141635		asp closed	7.2 kft	063	
143245		Land	-.29 kft	033	cranfield
143754		standstill	-.28 kft	307	52'04.36N, 0'37.50W


Analysis chart valid 12 UTC TUE 07 JUN 2005
GEOSTROPHIC WIND SCALE
IN KNOTS FOR ISOBARS AT 4 MB INTERVALS
POLAR STEREOGRAPHIC PROJECTION
N
70
60
50
40
L 1001
H 1014
L 1005
H 1021
L 1015
L 1011
L 990
L 997
H 1038
L 1013
L 1011
L 1012
H 1018
L 1001
H 1024
H 1028
L 1015
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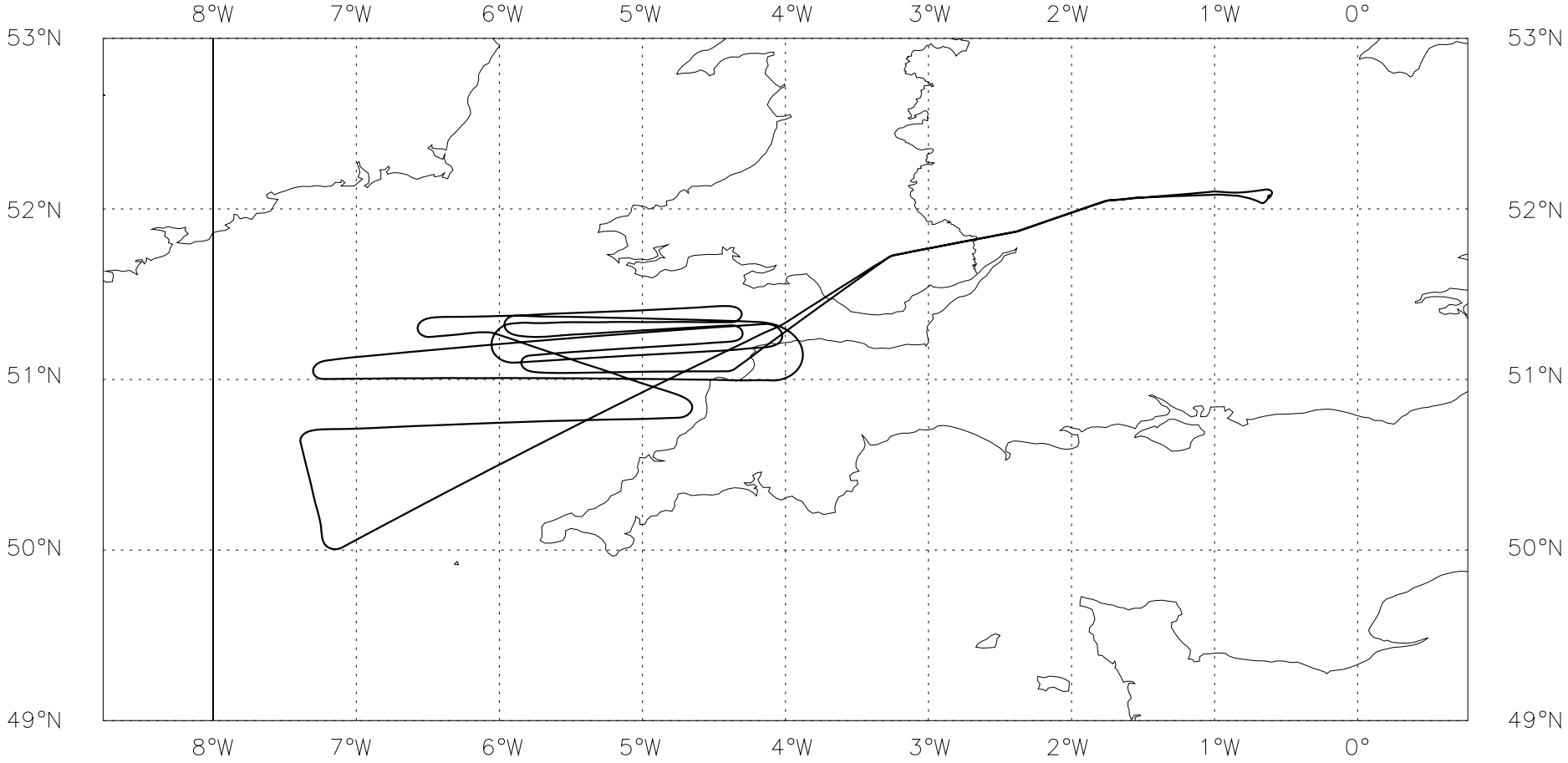
B100 Track 07-JUN-05



Mission Scientist's Log

MSci: KEITH BOWER CIRRUS 4

Flight No **B.100** Date 07/06/05 Page 1 of 7

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
					Rolling – 10:29:55
					T/O 10:39:18
KNB BST (=GMT+1:16) (10:42:15)	Transit	FL50			10:49:00 ≡ 09:48:44
09:49:30	T	FL50		52.0/1.5°W	5.54°/-12.24° 542mb 7m/s/36°
09:49:40	climb	from FL50	266		↑ to FL100
09:51:00	climb	FL 90	249	52.0/1.8W	0.76°/12.66° 10/359 717mb
9:52:10	Trans	FL 100	246	51.9/1.9W	NOXY cals start -1.2°C/-19.42°C 10m/s/356° 696mb @ 253kts
9:59:12	T	FL100	259	51.8/2.6.	Cirrus ahead + contrails – over Severn bridge – Left
					696mb -0.15°C/-18.65°C 8m/s/349° (248kts)
					SO_2 OK ✓ Bulb replaced – Nd seeing Signal (250kts)
10:05:00	T	FL100	233	51.6/3.3W	Heading Change +0.21°/-21.21° 6m/s/337 696mb
10:09:00	T	FL100	231	51.5/3.6W	SO_2 3ppb NOx -1.15ppb CO 123.1ppb
10:10:42	T	FL100			NOXY complete
10:11:10	P1 st	FL100 -240	251	51.3/3.8W	Climb to FL240
10:12:52	P1				LTI pumps on
10:15:08	P1				Photos 1-3
10:16:01	P1	14000'	236	51.2/4.2W	-7.02/-31.24°C 5m/s/353° 264kts 585mb
10:12:15	P1	19820'	240	50.9/4.8W	layer ahead 18-20,000' ft - layer above
10:22:48	P1	21600	240		is uniform 451mb -20.0/-28.0 8/314°
10:25:15	P1		240		Photos 2 R, L.
10:26:18	P1	FL240	240	50.7/5.3W	-24.68/-40.33 11/301 366mb 310kts
		FL260			Wheezy Cloud Upwind
10:29 ish		↑	240	50.6/5.5W	-34.32/-44.0 12m/s/305 355mb.
					2D- particle SIDI / SHR LIR, ↑ cirr.
10:30					

Mission Scientist's Log

M. Sci K. N. BOWER AIRBUS 4

Flight No **B**.100..... Date ...07/06/05..... Page ...2.. of ...7...

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
10:31:25	end P1	FL 280			
10:31:37	start R1	FL 280			-36.59/-37.19°C 8m/s/311 some agg - plates
	R1	FL 280			CPI SIR/LIR 2DC-2DP-SID. stalk - no habit.
10:33:22	R1	FL 280	240	50.4/6.1	R Faces Cam - Contrail 1000' ago 328mb
10:34:41		FL 280	240	50.3/6.3	Core Chem Calc - done - WAS Start 328mb
					Wing Vortices - R Camera - gust above Mentor
10:37:01					level - pressure drop → nucleation
10:38:12			240	50.2/6.6	2D- 2DC - in/out CPI b/rosette
10:41:40	end R1	FL 280		50.0/7.1	-38.13/-36.25°C 18 m/s/304 329mb 346kts
					(will now head N so that can carry out runs
					parallel to cont - will climb - P ascent
10:43:25	st P2	from FL 280	351	50.0/7.2	Start Profile
					2D - cons dropping CPI - BR.
					Out of 29000
					SID 2 - PC fallen out
10:47:43	end P2	FL 300			Above CT
10:49:20	SLR	FL 300	345	50.5/7.3	16/307° -45.66/-41.93
					Not Contrailing Now - Blue sky now and again
10:50:09					Contrails ahead / higher - Now turning Right
					2D- SID PC up and running.
10.51:06	st R2	FL 300	84	50.7/7.1	Above CT - Cloud ahead at this z
10:52:30					BR - CPI, 2DC - contains agg - nav in
10:53.18	R2	FL 300	84	50.7/6.9	Out of Cloud again -44.02/-40.97 10m/s/309
10:53:30	R2				Back in Cloud
10:58:52	R2	FL 300	84	50.7/6.0	PCASP - spikes - coincident with 2D

SIR ends BR - same legs BR -43.9/-41.7
12/m/s/317° 300mb 351 kts

Mission Scientist's Log

M. Sci: K.N. Bower CIRRUS 4

Flight No **B** 100 Date 07/06/05

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
11:01:08	end R2	FL 300			
11:01:17	st P3	FL 300	84	50.7/5.5W	CT looks much higher here (so can't see thro')
11:03:45					Phot 32 LMS/IRMS
					10/l - 2DC 2DP and d range - SID drop out
11:06:11	end P3	FL 320	83	50.7/4.8W	-48.93/-47.4' 14m/s/323 274mb 10/cm 352hits
					E-mail - Dave Kindred - 2hr left in C !!
11:08:54	st R3	FL 320	294	~~50.9~~.	-46.97/
11:10:20	R3	FL 320		50.9/4.9	-46.89/-47.74°C 21m/s/310 276mb 349hits
					Someone heard on AMS R/b - last run.
11:13:15h	R3				New heading out above CT - still some
11.15:00	R3	FL 320	295	51.1/5.6	Back in cloud -49.55/-47.27 23m/s/306
					(next we will try and get up another 1000'- head
					back in a more easterly direction - ATC
11:17:00	R3	FL 320			Very near CT. regrind plates - new
					more columns / plates / mix
11:17:58	R3	FL 320	295	51.2/5.9	SID2 balloon over again
11:18:53	(end R3/start P4)		294	51.2/6.0	23m/s/301° -49.75 -46.18
					CPC - behaving fine - flow ok
11:20:12	P4	32400	266	51.2/6.2	lots hex plates/trigonal plate - just at end R3
11:21:20		32800			2 Photos - top on Cabrail / C.
11:21:54	end P4	FL330	266	51.2/6.4	CT - seems lower here in West - Right Turn
11:23:40	turn	FL330	↻	51.3/6.5	- Photo CT's during turn. CCN start
11:24:33					Cloud Patch. (probs down CCN sample)
11:24:54	st R5	FL330	85	51.3/6.3	-52.34/-49.94 16m/s/297° 261mb 343 hits
11:27:40	R5	FL330	90	51.3/5.9	2 Photo - at CT -52.2/-50.7° 14m/s/324° 261mb

Mission Scientist's Log

M. Sci K.N. Bower CIRRUS 4

Flight No **B**..100..... Date .....07/06/05..... Page ...4... of ...7...

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
11:33:04	RS	FL330	88	51.3/5.0	-52.14/-50.02° 16m/s/309
					Gone thro - some particles - small 50μm
					Chigh parts pcasp - some time.
					CCN - gone flying
11:34:57	end RS start PS		89	51.3/4.5	(Sondes - blobs small hex plate/pods Be) CPI
11:37:07	end PS	FL340	89	51.3/4.3	-54.5/-52.06 250mb 14m/s/312 348kts
11:38:	—	FL340		51.3/4.1	still in CT. - changing headings (357kts)
11:43:48	st R6	FL340	272	50.9/4.1	still in cloud -54.74/-52.21 20m/s/300 249
11:46:41	R6	FL340	274	50.9/4.0	Abov. CT. - another layer above - pass not going
					to get above the higher layer -
11:51:00	R6	FL340			Out of cloud now - none above - CCN start
11:51:50	R6	FL340	273	50.9/5.2W	-54.7/-53.15 19m/s/296 249mb 356kts
11:54:55	R6	FL340			into Cloud - above too
11:57:39	R6	FL340			above CT agn./at CT
12:02:00	R6	FL340	272		Photo LMS - Abov CT - + contrail - Photo RMS
12:05:27	R6 end		273	51.0	-54.9/-56.12° 250mb 24/321°
12:06:46	R6 end		273	51.0, 7.1W	
12:09:00	descent				Photo at angle on RH turn at Cloud
12:09:32	end des	FL320			
12:08:13	st R7	FL320	76	~~51.1/6.8~~	
12:09:57	R7	FL320		51.1/6.8	11/315° -49.5°/-53.2° 273mb 347kts
					2D
12:19:44	R7				Photo LMS - a/c + Contrail.
12:25:18	R7	FL320	80	51.3/4.4W	Photo LMS of entire Cloud depth
12:27:05					(Now Cloud above, CCN spectrum dow

FL 280 1
FL 300 2
FL 320 3
FL 350 5
FL 340 6

RD ⇒ CB
FL280
310
320
300
260 1hr
250

2hr

1.5 left

Mission Scientist's Log

M. Sci: K. N. Bower CIRRUS 4

Flight No **B**.100..... Date ...07/06/05..... Page ...5... of ...7...

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
12:27:19	end R7	FL320		51.3/4.0W	turning to W leg at FL300 -49.12/-47.36
12:29:49	descend				FL320 → FL300 (334kts)
12:31:51	end R8	FL300	271	51.1/4.4W	-44.36/-42.95 In Cloud 19m/s/320° 300mb
12:32:58	R8	FL300	270	51.1/4.6	out of CT again - CPI low conc 40µm pk
					2DC - Hot wiring - no particles
12:34:44	R8				Core Chem Calc done → WAS
					Small Plates (30-80µm) Skeletal plate
12:38:30	R8			CPI =	Trigonal + Round Hex Plates - couple assemblages
					plates 2DC - small midsize
12:40.35	R8	FL300	268	51.1/5.5W	-44.19°C/-42.75°C 17m/s/306° 300mb 333kts
					(will extend (into wind) so get full 10mins on next Rec)
12:41.43	R8	FL300			(In CT again - weak thro' holes previously - will
					subsistent N on return leg to stay in cloud.)
12:42:36	end R8	FL300		51.0/5.9W	turning - descend at cloud FL280 - descending
12:43:40	turn ↓				Photo in RH turn - CT + balloon ? NOXY ✓
12:45:10					Photo RHS
					Wide angle of full cloud depth portrait
12:46:31	R9 st.	FL280	81	51.3/5.8W	Photo LHS - A/C + contrail
12:48:20					CPI - Photo ahead 12:48:50 2 photos RHS since portrait wide again
12:50:15	R9	FL280	86	51.3/5.3W	-38.71/-37.27°C 15m/s/316° 328mb 319kts
12:50:51	R9	FL280	85	51.3/5.1	KP in hole again - spec 2DV CPI still seems ice
12:52:35	R9	FL280			KP in cloud again 2DC ✓ CPI ✓
12:54:27	R9	FL280			Out of cloud again
12:55:15	R9	FL280	86	51.3/4.6	Photo RHS 2cm Cloud + plane + contrail
12:56:40	end R9	FL280		51.3/4.4	Going into cloud again

Mission Scientist's Log

M.Sci I.C.N. BOWER CIRRUS 4

Flight No **B**.100..... Date ....07/06/05..... Page ..6.. of ..7..

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
12:58:59	R10	FL270	272	51.4/4.4	19m/s/319° -36.35/-35.25° 343mb 312kt
					(deer in cloud – 2 more Runs after this)
13:10:25	R10 end	FL270	"	51.3/3.8	-36.97/-35.47 345mb 13/284°
13:12:54	R11 st	FL250	91	51.2/	-31.1/-30.12°C 375mb 15m/s/305° 300kt
					CPI - 20-30μm SPherods etc large 200μm assemb
					(BR breaths during descent)
					SO_2 - only below 15000 ft - no ext pump
13:18:26					3 Phots LHS (contrail + a/c) RHS + ahead
1319:15	R11	FL250	83	51.2/4.9	-32.12°C/-35.75°C 375mb 9m/s/301° 30kt
					Now picking up some CO -
					AMS - all OK - 3025 behaving - counts bigger
					than other 3025 ~ 1000's/ns 5×10^3 cm^{-2}
					2DC - very low ~ 50 l^{-1} spike - 10 l^{-1}
13:27:55	R11 end	FL250	83	51.3/4.3	⟳ ↓ 230
13:25:05	R12 st	FL230	268	51.2/4.3	-26.19°C/-39.87°C 408mb 12m/s/306°
					CPI - last Run 11 — large variety large plates/assemb
					then more spherical + large plates
					sublimation - descent prior to this run
13:28 ish	R12	FL230			Photo RHS + LHS
13:32 ish					CPI → many have gone then small fall streak
13:32:46	R12	FL230	267	51.1/52W	409mb -26.5/-34.25 9m/s/291° 288kt
13:34:55	R12	FL230	267	51.1/55W	fall streaks ahead – extend run into this
13:36:55	R12 end	FL230	"	51.1/57W	missed the streaks
13:38:00	⟳ ↓				2 plots RHS in Left turn – angle
13:36:50	R13	FL220	92	51.0/56W	427mb ~~FL0~~ -23.67°C/-28.06 8m/s/298°

Mission Scientist's Log

M.Sci. K. N. BOWER CIRRUS 4

Flight No **B**.100..... Date .....07/06/05..... Page ...7... of ...7...

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
	R13				WAS compressed gas ran out partway through R12
					(one bottle done) – no more sample possible
13:14:10	R13	FL220	86	51.0/5.0W	-23.46/-36.95°C, 427mb 8m/s/294° 28Kts
13:47:10	R13				Photo LHS, Photo RHS
13:48:52	R13end	FL220	87	51.0/4.4W	-24.17/-36.48 14m/s/330° 428mb descent
					to FL110. for NOXY cal.
13 53:13	NOXY	FL110	43	51.2/4.0W	Start NOXY cal -1.29°/18.91°C 1m/s/12° 235
					669mb
					NOXY cal completed
					1037 QNH
					1036 QNH.
15 33 07	ICNG	PST			Landing

FLIGHT NUMBER	B100	DATE:	7/6/05	OPERATOR:	RMP
PROJECT:	CIRRUS				

CORE CHEMISTRY PRE FLIGHT LOG

PRE POWER UP	
All sample lines are connected to the rack	OK
All cylinders pressures are OK	OK
Ozone Span = 504, Offset = 50	OK

GAS PRESSURES	N_2 (bar)	CO_2 / Argon (bar)	CO standard (bar)
PRE FLIGHT	52		
POST FLIGHT	45	130	

POST POWER UP - GROUND				
Ozone Sample Flow 1 (LPM)	**Ozone Sample Flow 2 (LPM)**	**NO_x Sample Flow (LPM)**	**NO_x Ozonator Flow (LPM)**	**SO_2 Sample Flow (LPM)**
0.45	**0.4**	**1.09**	**0.069**	
CO Time check against HORACE	**CO Lamp Flow (ml/min)**	**Pressure Monochromator (bar)**	**Pressure Cell (Torr)**	

ZEROS							Average
Ozone (ppbV)	**-1**	**-1**	**-1**	**-2**	**-1**	**-1**	**-1**
NO (ppbV)	**-0.22**	**-0.15**	**0.08**	**-0.10**	**0.02**	**0.13**	**-0.04**
NO_2 (ppbV)	**-0.62**	**-0.62**	**-0.62**	**-0.62**	**-0.76**	**-0.86**	**-0.68**
NO_X (ppbV)	**-0.84**	**-0.77**	**-0.70**	**-0.72**	**-0.74**	**-0.73**	**-0.75**
SO_2 (ppbV)	**0.93**	**0.32**	**0.50**	**0.41**	**0.11**	**0.65**	**0.49**

PRE FLIGHT COMMENTS

FLIGHT NUMBER	B100	DATE:	7/6/05	OPERATOR:	RMP
PROJECT:	CIRRUS				

CORE CHEMISTRY CALIBRATION AND FLOW LOG

PREVIOUS CO CAL	Date and Flight Level	Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)
	unknown			

Time	Flight Level	CO					
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)		Cell Press (Torr)
9:55:09	100	78.43	88.35	6928.83	50		7.13
		Flows (LPM unless stated)					
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_X Sample	NO_X Ozonator	SO_2 Sample
		33.94	0.75	0.7	1.090	0.069	0.361
Time	Flight Level	CO					
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)		Cell Press (Torr)
10:34:36	280	79.20	86.28	6833.36	50		7.11
		Flows (LPM unless stated)					
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_X Sample	NO_X Ozonator	SO_2 Sample
		33.89	0.7	0.8	1.001	0.066	ALARM
Time	Flight Level	CO					
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)		Cell Press (Torr)
10:50:44	300	78.18	86.84	6788.91	50		7.11
		Flows (LPM unless stated)					
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_X Sample	NO_X Ozonator	SO_2 Sample
		33.89	0.7	0.8	0.981	0.066	ALARM
Time	Flight Level	CO					
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)		Cell Press (Torr)
11:10:27	320	76.25	88.39	6739.88	50		6.50
		Flows (LPM unless stated)					
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_X Sample	NO_X Ozonator	SO_2 Sample
		33.85	0.7	0.8	0.955	0.068	ALARM
Time	Flight Level	CO					
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)		Cell Press (Torr)
11:24:55	330	74.62	90.57	6759.09	50		6.34
		Flows (LPM unless stated)					
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_X Sample	NO_X Ozonator	SO_2 Sample
		33.78	0.7	0.8	0.952	0.067	ALARM

FLIGHT NUMBER	B100	DATE:	7/6/05	OPERATOR:	RMP
PROJECT:	CIRRUS				

CORE CHEMISTRY CALIBRATION AND FLOW LOG

Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
11:40:09	340	74.31	91.59	6805.51	50	6.22
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_X Sample	NO_X Ozonator	SO2 Sample
		33.84	0.7	0.75	0.933	0.066	ALARM
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
12:10:31	210	74.45	90.34	6724.04	50	6.48
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_X Sample	NO_X Ozonator	SO2 Sample
		33.76	0.7	0.8	0.956	0.067	ALARM
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
12:34:31	300	75.11	89.63	6732.21	50	6.73
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_X Sample	NO_X Ozonator	SO2 Sample
		33.79	0.7	0.75	0.984	0.067	ALARM
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
12:49:41	280	75.54	88.89	6714.39	50	7.01
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_X Sample	NO_X Ozonator	SO2 Sample
		33.88	OK	OK	OK	OK	ALARM
Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
13:01:57	270	76.02	88.71	6743.48	50	7.13
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_X Sample	NO_X Ozonator	SO2 Sample
		33.82	OK	OK	OK	OK	ALARM

FLIGHT NUMBER	B100	DATE:	7/6/05	OPERATOR:	RMP
PROJECT:	CIRRUS				

CORE CHEMISTRY FLIGHT LOG

GENERAL COMMENTS

ASP opened 09:42

TO 9:38:37

TDLAS 10 s behind HORACE

11:55 TDLAS laptop switched itself off though data appears to be logging

FL250 non need for Co cal

FL 230 Quick cal performed

12:45 Co2 large increase

Leak on WAS case 2

ASP closed @ 14:15

CLOUD PHYSICS LOG

Flight No. B100 **Date: 07/06/05** **Operator: JT** **Page 1 of**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
10:11:12	52	0.08	4	2	0	0	0	0	0	0	Start Profile 1 FL100
10:12:17	86	0.08	4	0	0	0	0	0	0	0	FL110
10:13:23	54	0.09	4	2	0	0	0	0	0	0	FL120
10:14:28	250	0.1	4	0	0	0	0	0	0	0	FL130
10:15:37	147	0.11	4	2	0	0	0	0	0	0	FL140 FFSSP dau 7secs slow
10:16:40	81	0.11	4	0	0	0	0	0	0	0	FL150
10:17:45	110	0.1	4	0	0	0	0	0	0	0	FL160
10:18:50	64	0.12	4	0	0	0	0	0	0	0	FL170
10:19:55	43	0.1	4	0	0	0	0	0	0	0	FL180
10:20:55	106	0.14	4	2	0	0	0	0	0	0	FL190
10:21:51	28	0.07	4	0	0	0	0	0	0	0	FL200
10:22:49	13	0.07	4	2	0	0	0	0	0	0	FL210
10:23:56	15	0.08	4	0	0	0	0	0	0	0	FL220
10:24:55	10	0.07	4	0	0	0	0	0	0	0	FL230
											FL240
											FL250
											FL260
											FL270
								Data lost	Cloud	started	FL280
								End of P1 and	Run 1	Lost	
											Aux Comp 2 fell over @ 10:45
											All restarted @ 10:50
10:51:07	16	0.09	11	0	0	0	0	0	00	0	Run 2 FL300
10:53:00	16	0.1	11	10	17	200	4	NOISE			
10:55:00	38	0.12	11	50	10	250	4	NOISE			
10:57:00	28	0.1	12	10	9.5	250	10	NOISE			Comp aux 2 fall over times
10:59:00	20	0.09	12	75	75	200	10	NOISE			10:45, 11:06, 11:17
11:01:00											

CLOUD PHYSICS LOG

Flight No. B **Date:** **Operator:** **Page of**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
11:17	Aux comp	2 fell	Over again	Autosave setup	For 1 min	intervals	failed				N.B. SID2 data files B100, B100a
	SID 2	ammeter	fluctauting	Between 0 & 2	Amps	Inst	Turned	off	11:26		And B100b
11:24:54	10	0.14	16	25	43	175	11	0	0	0	Run 5 @FL330
11:26:00	10	0.12	16	10	17	125	8	0	0	00	
11:28:00	11	0.28	16	25	7	200	8	0	0	0	
11:30:00	12.7	0.13	16	5	2.5	125	8	0	0	0	
11:32:00	10.8	0.12	17	25	14.5	100	11	0	0	0	
11:34:55	7	0.2	17	10	3	150	11				End of run and start P 5 FL330
11:37:03	14	0.2	17	25	9.5	125	11				FL340 end of P5
11:43:48	22	0.34	18	10	4.5	25	11				Start run 6 @FL340
11:45:00	7.64	0.24	18	85	0	0	0	0	0	0	
11:47:00	16	0.14	18	10	10	100	11	0	0	0	
11:49:00	12.06	0.21	18	50	4	150	11	0	0	0	
11:51:00	9.5	0.09	18	5	0	0	0	0	0	0	
11:53:00	13.9	0.22	18	100	45	100	11	0	0	0	
11:55:00	15.48	0.17	19	2	0	0	0	0	0	0	
11:57:00	13.7	0.09	19	10	7.5	125	11	0	0	0	
11:59:00	44	0.55	19	75	8.5	100	11	0	0	0	
12:01:00	15.38	0.09	19	10	15.5	125	11	0	0	0	
12:03:00	14	0.09	19	0	0	0	0	0	0	0	Left cloud bank behind
12:05:00	22.9	0.11	19	0	0	0	0	0	0	0	
12:05:44	16.99	0.1	19	0	0	0	0	0	0	0	End of run 6
12:08:14	17	0.08	19	0	0	0	0	0	0	0	Start run 7 @ FL320
12:10:00	16.69	0.09	19	0	0	0	0	0	0	0	
12:12:00	15.18	0.11	19	2	0	0	0	0	0	0	Accidental hit 28v sid1 switch
12:14:00	13.97	0.1	19	0	0	0	0	0	0	0	Whilst reaching for comms
12:16:00	122	0.09	19	100	24	125	11	0	0	0	
12:18:00	19.1	0.11	19	75	28	100	11	0	0	0	
12:20:00	28.15	0.1	19	0	0	0	0	0	0	0	
12:22:00	24.13	0.08	19	5	0	0	0	0	0	0	
12:24:00	125	0.27	20	100	29	100	11	0	0	0	

CLOUD PHYSICS LOG

Flight No. B **Date:** **Operator:** **Page of**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
12:26:00	66	0.23	20	10	2.5	125	11	0	0	0	
12:27:00	30	0.09	20	10	21	175	11	0	0	0	End run 7
12:31:36	68	0.08	20	2	0.5	250	8	0	0	0	Start run 8 @ FL 300
12:33:00	46	0.09	20	0	0	0	0	0	0	0	
12:35:00	32.17	0.08	20	7.5	14.5	150	10	0	0	0	
12:37:00	44	0.14	20	25	17.5	250	10	0	0	0	
12:39:00	55	0.08	20	25	9.5	200	10	0	0	0	
12:41:00	34.17	0.17	20	10	18	175	10	0	0	0	
12:42:37	18.09	0.09	21	0	15	225	10	0	0	0	End run 8
12:46:41	43	0.2	21	100	37	220	8	0	0	0	Start run 9 @ FL280
12:48:00	94	0,72	22	50	25	275	8	NOISE			
12:50:00	262	0.72	23	10	18	275	10	NOISE			
12:52:00	71	0.11	23	75	16	275	7	NOISE			
12:54:00	117	0.07	24	10	21	100	10	NOISE			
12:56:44	29	0.09	24	10	12	200	8	NOISE			End of run
12:58:57	23	0.1	24	10	5	250	8	NOISE			Start of run 10 @ FL270
13:00:00	99	0.14	25	100	25	225	8	NOISE			
13:02:00	30	0.18	25	50	14.5	175	10	NOISE			
13:04:00	219	0.08	25	75	20	200	10	NOISE			
13:06:00	40	0.16	25	90	32	225	10	NOISE			
13:08:00	298	0.35	26	90	40	225	10	NOISE			
13:10:26	37	0.08	26	2	0	0	0	NOISE			End of Run 10
13:12:55	34	0.2	26	75	31	200	10	NOISE			Start of Run 11 @ FL 250
13:14:00	37	0.17	26	100	24	225	8	NOISE			
13:16:00	63	0.17	27	75	2.5	425	10	NOISE			
13:18:00	33	0.09	27	10	5	225	8	NOISE			
13:20:00	201	0.12	27	75	26	350	10	1233	400	10	
13:22:55	33.17	0.11	27	2	3	200	8	8325	200	8	End of run 11
13:25:05	22	0.1	28	0	0	0	0	DEGRADED			Start of run 12 @ FL230
13:27:00	26	0.08	28	0	0	0	0	DEGRADED			
13:29:00	20	0.08	28	0	0	0	0	DEGRADED			
13:31:00	59	0.11	28	0	0	0	0	500	600	8	

CLOUD PHYSICS LOG

Flight No. B **Date:** **Operator:** **Page of**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
13:33:00	40	0.11	28	0	0	0	0	0	0	0	
13:35:00	68	0.11	28	0	0	0	0	DEGRADED			
13:36:51	26	0.08	28	0	0	0	0	0	0	0	End of run 12
13:38:54	45	0.11	28	0	0	0	0	100	DEGRA	DED	Start of Run 13 @ FL220
13:40:00	35	0.12	28	0	0	0	0	0	0	0	
13:42:00	58	0.1	28	0	0	0	0	0	0	0	
13:44:00	38	0.1	28	0	0	0	0	0	0	0	
13:46:00	27	0.09	28	0	0	0	0	0	0	0	
13:48:00	27	0.09	28	0	0	0	0	0	0	0	
13:48:54	33	0.08	28	0	0	0	0	0	0	0	End of run 13

Flight No B100

CCNC LOG

Exp. CIRRUS

Date 09/06/05

Page 1 of __

ALLEVIATOR GMT ON	ALLEVIATOR GMT OFF	Height	TEMP INLET	STATIC 1	2	3	4	5		REMARKS
				1.75	2.5	3.5	4.25	5.5		
10:50										GROUND
			17.92	0.55	0.78				S	
			17.41	420	692				D	TEST
				344	844				B	
				2245	2260				R	
				1022	1228				P	
10:50:08	10:51:01	300	23.65	052	0.74	1.11	1.42	2.07	S	
			23.56	254	415	252	43	510	D	
			2352	350	346	346	342	653	B	
			23.41	2361	2357	2359	2341	2051	R	
			22.91	807.1	807.1	807.5	807.5	807.5	P	
				1.75	2.5	3.5	4.25	5.5		
11:23	11:25	330		0.49					S	
~~11:51~~	~~11:52~~	~~320~~							D	FAULT
									B	
									R	
				773					P	
11:51	11:52	340	24.85	0.51	0.77	1.01	1.42	2.06	S	
			24.89	623	578	738	748	732	D	
			24.75	608	608	619	618	617	B	
			24.89	2434	2461	2465	2482	2486	R	
			24.99	761.2	761.1	761.2	760.8	761.4	P	
				1.75	2.5	3.5	4.25	5.5		
12:12	12:13	320	24.99	0.50	0.73	1.10	1.42	2.08	S	
			24.76	637	524	769	722	827	D	
			25.08	606	604	605	607	607	B	
			25.09	2430	2429	2421	2409	2378	R	
			24.26	7847	7850	7850	784.4	784.9	P	
									S	
									D	
									B	
									R	
									P	

WAS Sampling Summary

Flight Number:	B100	Campaign Name:	CIRRUS
Date:	07/06/2005	Operator:	J. Hopkins (York)

Bottle Start Fill Time	Bottle End Fill Time	Bottle Number	Comments	Final Pressure (bar)
10:30:00			Take off; NOxy cals	
10:31:00			Level run at FL280 in cloud	
10:36:00	10:37:00	33	FL280, in cloud near top	2.32
10:39:29	10:40:29	34	FL280, in cloud near top	2.32
10:44:20			Profile 2 to FL300	
10:51:07			Level run at FL300	
10:52:48	10:53:48	35	FL300, still in cloud nearer top	2.18
10:58:35	10:59:35	36	FL300, still in cloud nearer top	2.18
11:02:20			Profile 3: FL300 to FL320	
11:08:55			Level run at FL320	
11:13:31	11:14:31	37	FL320 near top of cloud- patchy	2.02
11:16:30	11:17:30	38	FL320 near top of cloud- patchy	2.03
11:18:57			Profile 4: FL320 to FL330	
11:24:54			Level run at FL 330	
11:26:15	11:27:15	39	FL330 almost on top of cloud	1.93
11:32:01	11:33:01	40	FL330 almost on top of cloud	1.93
~11:35:00			Profile 5: FL220 to FL340	
11:43:47			Level run at FL340	
11:46	11:47:00	41	FL340 close to top of cloud	1.83
11:51:30	11:52:30	42	FL340 close to top of cloud	1.83
~12:06			Descend to FL320	
12:08:21			Level run 7 at FL320	
12:11:45	12:12:45	43	FL320 above cloud	1.98
12:17:21	12:18:21	44	FL320 within cloud	1.98
12:24:02	12:25:02	45	FL320 within cloud	1.98

~12:30			Descend FL320 to FL300	
12:31:39			Level run 8 at FL300	
12:36:01	12:37:01	46	FL300, bottle filled in hole in cloud	2.20
12:39:45	12:40:45	47	FL300, in cloud	2.14
~12:43			Descend FL300 to FL280	
12:46:52			Level run 9 at FL280	
12:51:46	12:52:46	48	FL280 in cloud (maybe in another hole in cloud though)	2.30
12:54:30	12:55:30	49	FL280 in cloud	2.30
~12:57			Descend FL280 to FL270	
12:58:59			Level run 10 at FL270	
13:03:26	13:04:26	50	FL270	
13:05:59	13:06:59	51	FL270	2.44
13:10:25			Descend FL270 to FL250	
13:13:02			Level run 11 at FL250	
13:15	13:16:00	52	FL250	2.56
13:20:30	13:21:30	53	FL250	2.52
~13:23			Descend FL250 to FL230	
13:25:05			Level run 12 at FL230	
13:29:30	13:30:30	54	FL230	2.40
			Compressed air cylinder empty. p = 55 bar at start and during flight. Indicates possible leak on case 2?	

Faults / Incidents Log

Flight No. B100
Date: 07/06/05

Instruments

1. Video – DFC display out of focus. Inboard display switches off . Also, RFC (marked DFC…) is virtually black on pc monitor, whereas it displays well on video monitor unit.
2. Mission Scientist's laptop – needs new ethernet cable, the connector at the pc end is falling off.
3. Upper Pyrgeometer – Zero signal following radiance signal exactly.
4. NOX – occasional flutters above max chamber temp but otherwise okay.
5. Mechanical fault with Flight Manager drawer.
6. SID2 pc repeatedly crashed. Eventually switched off
7. Aft Core console pc drawer key bent badly – unusable.
8. WAS gas ran out prior to final fill.

Aircraft

Satcom H:- Two calls made by FM (both very brief)

Flight Manager's Instrument Status Log

Flight No. **B**100 Date: 07/06/05

Instrument	Fitted	Operated	Instrument	Fitted	Operated
Navigation			**Cloud Physics**		
INU		**Y**	**Probes**		
GPS		**Y**	FFSSP	**Y**	**Y**
Satcom C		**Y**	PCASP	**Y**	**Y**
Satcom H		**Y**	2D-P	**Y**	**Y**
Thermometers			2D-C	**Y**	Y
De-Iced Temp		**Y**	Cloudscope	**N**	**N**
Non De-Iced		**Y**	SID 1	**Y**	**Y**
Heimann	**N**		SID 2	**Y**	**Y**
Hygrometers					
G. Eastern		**Y**	HVPS	**N**	
J. Williams		**Y**	CIP25	**Y**	**N**
Nevzorov		**Y**	CIP100	**Y**	**N**
TWC		**Y**			
FWVS	**Y**	**N**	**Racks:**		
Radiometers			INC	**Y**	**N**
Upper Clear	**Y**	**Y**	CCN / CNC	**Y**	**Y**
" Red	**Y**	**Y**	CVI	**Y**	**N**
" Silicon	**Y**	**Y**			
" JO1D	**Y**	**Y**	**Aerosol**		
Lower Clear	**Y**	**Y**	PSAP	**Y**	**N**
" Red	**Y**	**Y**	Nephelometer	**N**	
" Silicon	**Y**	**Y**	Filters	**Y**	**N**
" JO1D	**N**		AMS	**Y**	**Y**
Large Radiometers					
TAFTS	**N**				
MARSS	**N**				
DEIMOS	**N**		**Others:**		
ARIES	**N**		NIR TDLAS	**Y**	**Y**
SWS	**N**		2BT O3	**Y**	**N**
Chemistry			VACC	**Y**	**N**
Ozone	**Y**	**Y**	PEROXIDE	**Y**	**Y**
ECGC	**N**		Formaldehyde	**Y**	**N**
NOX	**Y**	**Y**	ADA	**Y**	**Y**
CO	**Y**	**Y**	CPI	**Y**	**Y**
ORAC	**Y**	**N**	NOxy	**Y**	**Y**
PAN	**Y**	**N**	PTRMS	**Y**	**Y**
PERCA	**N**	**N**	Bag Sampling	**Y**	**N**
WAS	**Y**	**Y**			

00100 07-JUN-05 11:03:28 436 Hi Alan/Keith,

Hi Alan/Keith,
The Ci back edge is approaching you from the NW.
Best areas to work are probably: (a) 50 deg N, over Cornwall, or just over the sea going W (near Scillies). If possible, also head southwards. Or (b) Bristol Channel, as far up the estuary as you can realistically go (around Bristol ?). You probably have about another 2 hours max in either area on latest estimates from satpix. Is the Ci currently workable ?

Dave K (Exeter)

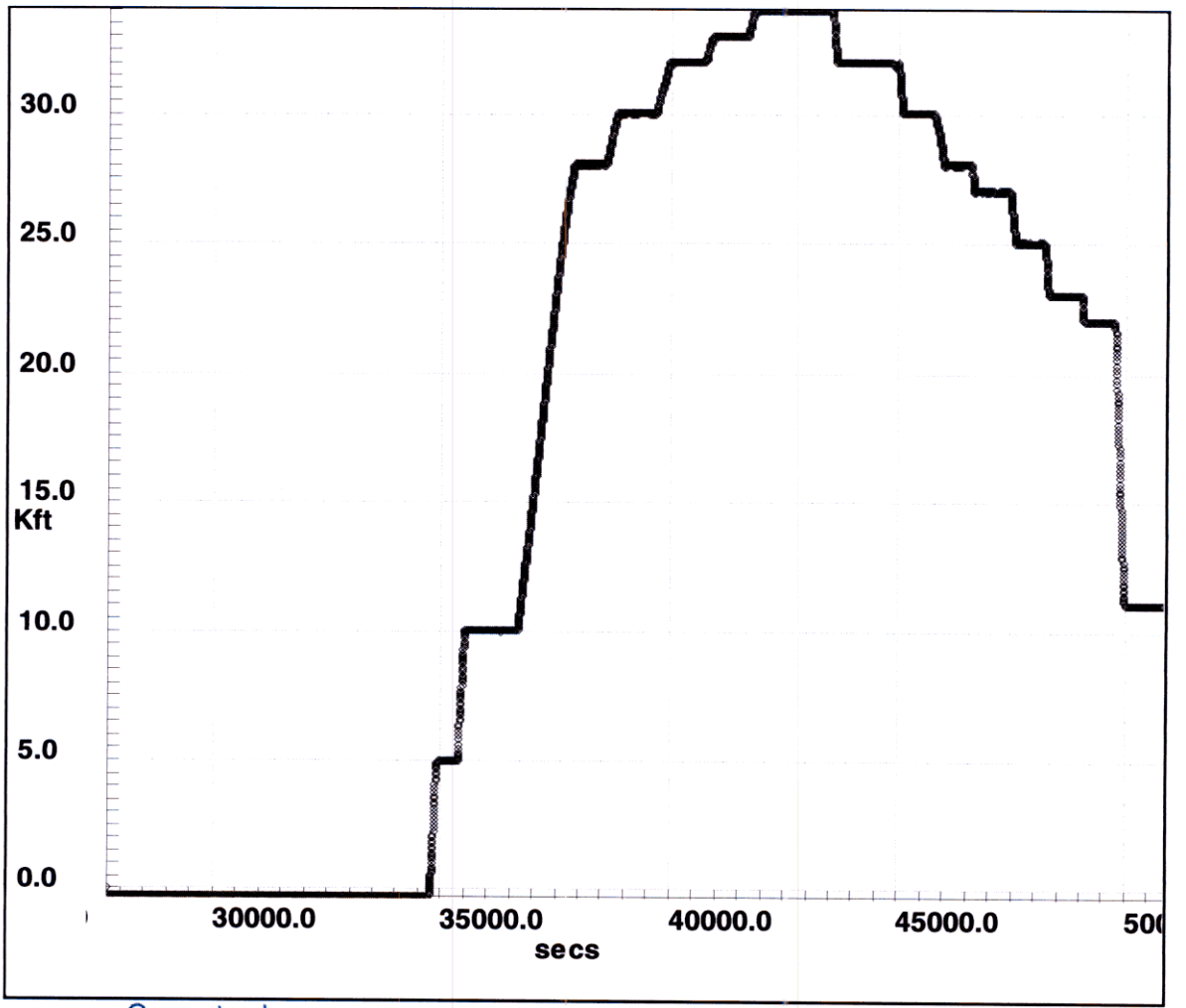
Flight B100 14:06:57

Heading 73 deg Speed 236 knots Height 11.0kft Press 669mb

Lat 51.7N Long 2.9W Wind 5 ms-1/ 334 deg

Temp -2.06C Dewpoint -20.41C

From start to now



Current values

	PRESSURE HEIGHT	11.04	Kft	All
◇◇◇◇◇	TIME FROM MIDNIGHT	50817	secs	